

Docket No.: M4065.0105/P105-C  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

---

In re Patent Application of:  
Howard E. Rhodes

Examiner: Not Yet Assigned

Application No.: Not Yet Assigned

Art Unit: N/A

Filed: April 16, 2004

For: TRENCH PHOTSENSOR FOR A  
CMOS IMAGER

---

**INFORMATION DISCLOSURE STATEMENT (IDS)**

Commissioner for Patents  
MS: Patent Application  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 CFR 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement accompanies the new patent application submitted herewith.

Copies of the references on the PTO/SB/08 are not provided.

Those patents and publications which are marked with an asterisk (\*) next to the Cite No. in the attached form PTO/SB/08 are not supplied because they were previously cited by or submitted to the Office in a prior application number 10/287,626, filed

November 5, 2002 and relied upon in this application for an earlier filing date under 35 U.S.C. 120.

In accordance with 37 CFR 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 CFR 1.56(a) exists. In accordance with 37 CFR 1.97(h), the filing of this Information Disclosure statement shall not be construed to be an admission that any patent, publication or other information referred to therein is "prior art" for this invention unless specifically designated as such.

It is submitted that the Information Disclosure Statement is in compliance with 37 CFR 1.98 and the Examiner is respectfully requested to consider the listed references.

The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 04-1073, under Order No. M4065.0105/P105-C. A duplicate copy of this paper is enclosed.

Dated: April 16, 2004

Respectfully submitted,

By 

Thomas J. D'Amico

Registration No.: 28,371

DICKSTEIN SHAPIRO MORIN &  
OSHINSKY LLP

2101 L Street NW

Washington, DC 20037-1526

(202) 785-9700

Attorney for Applicant

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

|   |   |    |   |                          |                  |
|---|---|----|---|--------------------------|------------------|
| Substitute for form 1449A/PTO<br><br><b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br><i>(use as many sheets as necessary)</i> |   |    |   | <b>Complete if Known</b> |                  |
|   |   |    |   | Application Number       | Not Yet Assigned |
|   |   |    |   | Filing Date              | April 16, 2004   |
|   |   |    |   | First Named Inventor     | Howard E. Rhodes |
|   |   |    |   | Art Unit                 | 2813             |
|   |   |    |   | Examiner Name            | T. Nguyen        |
| Sheet   | 1 | of | 1 | Attorney Docket Number   | M4065.0105-C     |

| U.S. PATENT DOCUMENTS |                          |  |                                |  |  |
|-----------------------|--------------------------|--|--------------------------------|--|--|
| Examiner<br>Initials* | Cite<br>No. <sup>1</sup> | Document Number                          | Publication Date<br>MM-DD-YYYY | Name of Patentee or Applicant<br>of Cited Document | Pages, Columns, Lines,<br>Where Relevant<br>Passages or Relevant<br>Figures Appear |
|                       |                          | Number-Kind Code <sup>2</sup> (if known) |                                |  |  |
|                       | AA                       | *4,374,700                               | 02/1983                        | Scott et al.                                       |  |
|                       | AB                       | *5,055,900                               | 10/1991                        | Fossum et al.                                      |  |
|                       | AC                       | *5,173,756                               | 12/1992                        | Wong et al.  |  |
|                       | AD                       | *5,319,604                               | 06/1994                        | Imondi et al.                                      |  |
|                       | AE                       | *5,461,425                               | 10/1995                        | Fowler et al.                                      |  |
|                       | AF                       | *5,471,515                               | 11/1995                        | Fossum et al.                                      |  |
|                       | AG                       | *5,541,402                               | 07/1996                        | Ackland et al.                                     |  |
|                       | AH                       | *5,576,763                               | 11/1996                        | Ackland et al.                                     |  |
|                       | AI                       | *5,612,799                               | 03/1997                        | Yamazaki et al.                                    |  |
|                       | AJ                       | *5,614,744                               | 03/1997                        | Merrill  |  |
|                       | AK                       | *5,625,210                               | 04/1997                        | Lee et al.   |  |
|                       | AL                       | *5,705,846                               | 01/1998                        | Merrill  |  |
|                       | AM                       | *5,708,263                               | 01/1998                        | Wong   |  |
|                       | AN                       | *5,721,425                               | 02/1998                        | Merrill  |  |
|                       | AO                       | *5,731,622                               | 03/1998                        | Sugiyama et al.                                    |  |
|                       | AP                       | *5,757,045                               | 05/1998                        | Tsai et al.  |  |
|                       | AQ                       | *6,118,142                               | 09/2000                        | Chen et al.  |  |
|                       | AR                       | *5,239,193                               | 08/1993                        | Berton   |  |
|                       | AS                       | *4,972,244                               | 11/1990                        | Buffet et al.                                      |  |
|                       | AT                       | *6,051,447                               | 04/2000                        | Lee et al.   |  |
|                       | AU                       | *6,306,676                               | 10/2001                        | Stevens et al.                                     |  |
|                       | AV                       | *6,350,127                               | 02/2002                        | Chiang et al.                                      |  |

| FOREIGN PATENT DOCUMENTS |                          |   |                                |  |  |                |
|--------------------------|--------------------------|---|--------------------------------|--|--|----------------|
| Examiner<br>Initials*    | Cite<br>No. <sup>1</sup> | Foreign Patent Document   | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines,<br>Where Relevant<br>Passages or Relevant<br>Figures Appear | T <sup>6</sup> |
|                          |                          | Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known) |                                |  |  |                |
|                          |                          |   |                                |  |  |                |

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See attached Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the application number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

|                       |  |                    |  |
|-----------------------|--|--------------------|--|
| Examiner<br>Signature |  | Date<br>Considered |  |
|-----------------------|--|--------------------|--|

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

|  |   |    |   |                          |                  |
|--|---|----|---|--------------------------|------------------|
| Substitute for form 1449A/PTO  |   |    |   | <b>Complete if Known</b> |                  |
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br><i>(use as many sheets as necessary)</i> |   |    |   | Application Number       | Not Yet Assigned |
|  |   |    |   | Filing Date              | April 16, 2004   |
|  |   |    |   | First Named Inventor     | Howard E. Rhodes |
|  |   |    |   | Art Unit                 | 2813             |
|  |   |    |   | Examiner Name            | T. Nguyen        |
| Sheet  | 2 | of | 1 | Attorney Docket Number   | M4065.0105-C     |

| OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS |                       |  |                 |
|---|-----------------------|--|-----------------|
| Examiner Initials                                 | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup>  |
|   | CA                    | *Dickinson, A., et al., <u>A 256x256 CMOS Active Pixel Image Sensor with Motion Detection</u> , 1995 IEEE International Solid-State Circuits Conference, pps. 226-227.   |                 |
|   | CB                    | *Dickinson, A., et al., <u>Standard CMOS Active Pixel Image Sensors for Multimedia Applications</u> , Proceedings of Sixteenth Conference on Advanced Research in VLSI, March 27-29, 1995, pps. 214-224.   |                 |
|   | CC                    | *Eid, E-S., et al., <u>A 256 x 256 CMOS Active Pixel Image Sensor</u> , Proc. SPIE Vol. 2415, April 1995, pps. 265-275.  |                 |
|   | CD                    | *Fossum, E., <u>CMOS Image Sensors: Electronic Camera On A Chip</u> , 1995 IEEE, pps. 17-25.   |                 |
|   | CE                    | *Fossum, E., et al., <u>IEDM A 37x28mm<sup>2</sup> 600k-Pixel CMOS APS Dental X-Ray Camera-on-a-Chip with Self-Triggered Readout</u> , 1998 IEEE International Solid-State Circuits Conference, pps. 172-173.  |                 |
|   | CF                    | *Fossum, E., <u>Low Power Camera-on-a-Chip Using CMOS Active Pixel Sensor Technology</u> , 1995 IEEE, pps. 74-77.  |                 |
|   | CG                    | *Fossum, E., <u>Architectures for focal plane image processing</u> , Optical Engineering, Vol. 28, No 8, August 1989, pps. 865-871.  |                 |
|   | CH                    | *Janesick, J., et al., <u>New advancements in charge-coupled device technology - sub-electron noise and 4096x4096 pixel CCDs</u> , Proc. SPIE Vol. 1242, 1990, pps. 223-237.   |                 |
|   | CI                    | *Kemeny, S.E., et al., <u>Update on focal-plane image processing research</u> , Proc. SPIE Vol. 1447, 1991, pps. 243-250.  |                 |
|   | CJ                    | *Mendis, S., et al., <u>CMOS Active Pixel Image Sensor</u> , IEEE Transactions on Electron Devices, Vol. 41, No. 3, March 1994, pps. 452-453.  |                 |
|   | CK                    | *Mendis, S.K., et al., <u>A 128 x 128 CMOS Active Pixel Image Sensor for Highly Integrated Imaging Systems</u> , 1993 IEEE, pps. 583-586.  |                 |
|   | CL                    | *Mendis, S.K., et al., <u>CMOS Active Pixel Image Sensors for Highly Integrated Imaging Systems</u> , IEEE Journal of Solid-State Circuits, Vol. 32, No. 2, February 1997, pps. 187-197.   |                 |
|   | CM                    | *Mendis, S.K., et al., <u>Design of a Low-Light-Level Image Sensor with On-Chip Sigma-Delta Analog-to-Digital Conversion</u> , Proc. SPIE Vol. 1900, July 1993, pps. 31-39.  |                 |
|   | CN                    | *Mendis, S.K., et al., <u>Low-Light-Level Image Sensor with On-Chip Signal Processing</u> , Proc. SPIE Vol. 1952, November 1993, pps. 23-33.   |                 |
|   | CO                    | *Mendis, S.K., et al., <u>Progress In CMOS Active Pixel Image Sensors</u> , Proc. SPIE Vol. 2172, May 1994, pps. 19-29.  |                 |
|   | CP                    | *Nakamura, J., et al., <u>CMOS Active Pixel Image Sensor with Simple Floating Gate Pixels</u> , IEEE Transactions on Electron Devices, Vol. 42, No. 9, September 1995, pps. 1693-1694.   |                 |
|   | CQ                    | *Nixon, R.H., et al., <u>256 x 256 CMOS Active Pixel Sensor Camera-on-a-Chip</u> , IEEE Journal of Solid-State Circuits, Vol. 31, No. 12, December 1996, pps. 2046-2050.   |                 |
| Examiner Signature                                |                       |  | Date Considered |

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

|  |   |    |   |                          |                  |
|--|---|----|---|--------------------------|------------------|
| Substitute for form 1449A/PTO  |   |    |   | <b>Complete if Known</b> |                  |
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br><br><i>(use as many sheets as necessary)</i> |   |    |   | Application Number       | Not Yet Assigned |
|  |   |    |   | Filing Date              | April 16, 2004   |
|  |   |    |   | First Named Inventor     | Howard E. Rhodes |
|  |   |    |   | Art Unit                 | 2813             |
|  |   |    |   | Examiner Name            | T. Nguyen        |
| Sheet  | 3 | of | 1 | Attorney Docket Number   | M4065.0105-C     |

|    |  |  |
|----|--|--|
| CR | *Nixon, R.H., et al., <u>256x256 CMOS Active Pixel Sensor Camera-on-a-Chip</u> , 1996 IEEE International Solid-State Circuits Conference, pps. 178-179.                                      |  |
| CS | *Panicacci, R., et al., <u>Programmable multiresolution CMOS active pixel sensor</u> , Proc. SPIE Vol. 2654, March 1996, pps. 72-79.   |  |
| CT | *Panicacci, R.A., et al., <u>128Mb/s Multiport CMOS Binary Active-Pixel Image Sensor</u> , 1996 IEEE International Solid-State Circuit Conference, pps. 100-101.                             |  |
| CU | *Yadid-Pecht, O., et al., <u>CMOS Active Pixel Sensor Star Tracker with Regional Electronic Shutter</u> , IEEE Journal of Solid-State Circuits, Vol. 32, No. 2, February 1997, pps. 285-288. |  |
| CV | *Yadid-Pecht, O., et al., <u>Wide dynamic range APS star tracker</u> , Proc. SPIE Vol. 2654, March 1996, pps. 82-92.   |  |
| CW | *Zarnowski, J., et al., <u>Imaging options expand with CMOS technology</u> , Laser Focus World, June 1997, pps. 125-130.   |  |
| CX | *Zhou, Z., et al., <u>A Cmos Imager with On-Chip Variable Resolution for Light-Adaptive Imaging</u> , 1998 IEEE International Solid-State Circuits Conference, pps. 174-175.                 |  |
| CY | *Zhou, Z., et al., <u>A Digital CMOS Active Pixel Image Sensor For Multimedia Applications</u> , Proc. SPIE Vol. 2894, September 1996, pps. 282-288.   |  |

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup>Applicant's unique citation designation number (optional). <sup>2</sup>Applicant is to place a check mark here if English language Translation is attached.

|                       |  |                    |  |
|-----------------------|--|--------------------|--|
| Examiner<br>Signature |  | Date<br>Considered |  |
|-----------------------|--|--------------------|--|